

Refractory Materials Batch Control System

Dry Press Batching and Mixing Controls Replacement

- ✓ Batch Control
- ✓ Mixing Control

A.P. Green Industries, Inc.
Mexico, MO

Allen-Bradley directed us to Bachelor Controls as a competent systems integrator with experience working with Allen-Bradley components. We were impressed with their experience with a broad range of automated systems and how quickly they were able to understand the details of our complex system.

John Qualls
Project Engineer
A.P. Green



Project Summary

The A.P. Green plant in Mexico, Missouri, was one of the world's largest facilities for the production of clay-alumina refractory brick, tile, and monolithic materials. Bachelor Controls (BCI) was brought in to design and supply a replacement control system for batching and mixing refractory materials used to form brick and tile by the dry press process. The brick and tile — which are kiln-fired after forming — are used in heat-resistant linings for furnaces and vessels in a broad range of industrial applications.



Objectives / Requirements

A.P. Green sought to practically eliminate the risk of a controls malfunction with the potential for an extended interruption of production. The BCI system replaced a 12-year-old, obsolete, proprietary system, which had become difficult to maintain and support. In addition to improvements in reliability, component availability, and support service, some efficiencies were anticipated due to improved process control and operator interface.

A.P. Green's specification required the control system to manage the concurrent batching, batch routing, mixing, and mix delivery to storage for four mixers, including

- Management of nearly 100 product formulas
- Accurate feeding and weighing of dry ingredients from 24 silos into six scales
- Routing of batches from scales to mixers via diverter gates, vibrating conveyors, pneumatic conveyors and skip hoists
- Weighing and discharge of liquid ingredients
- Control of mixers and mixing cycle
- Delivery of mixed material from three mixers to nine holding bins via monorail hoist and bucket systems

Results / Benefits

BCI enhanced the HMI package with two supplementary programs. The first provides formula management capability, and the second provides production reports such as batch logs, ingredient usage, and batch summary reports. BCI also prepared a complete set of updated control drawings for the project. Removal of the old system and installation and initial start up of the new system were accomplished during a nine-day shutdown "window." A.P. Green electrical maintenance personnel removed the old control components and rewired to-and-from the pre-wired enclosures supplied by BCI. BCI installed and commissioned the new system hardware and software and provided on-site start-up and operator training services.

During the first year of operation, the BCI-supplied system met or exceeded all our requirements and system support has been excellent.

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